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HONOLULU

LA JOLLA

TIBURON

SOUTHWEST FISHERIES CENTER

MONTHLY REPORT - JANUARY 1976

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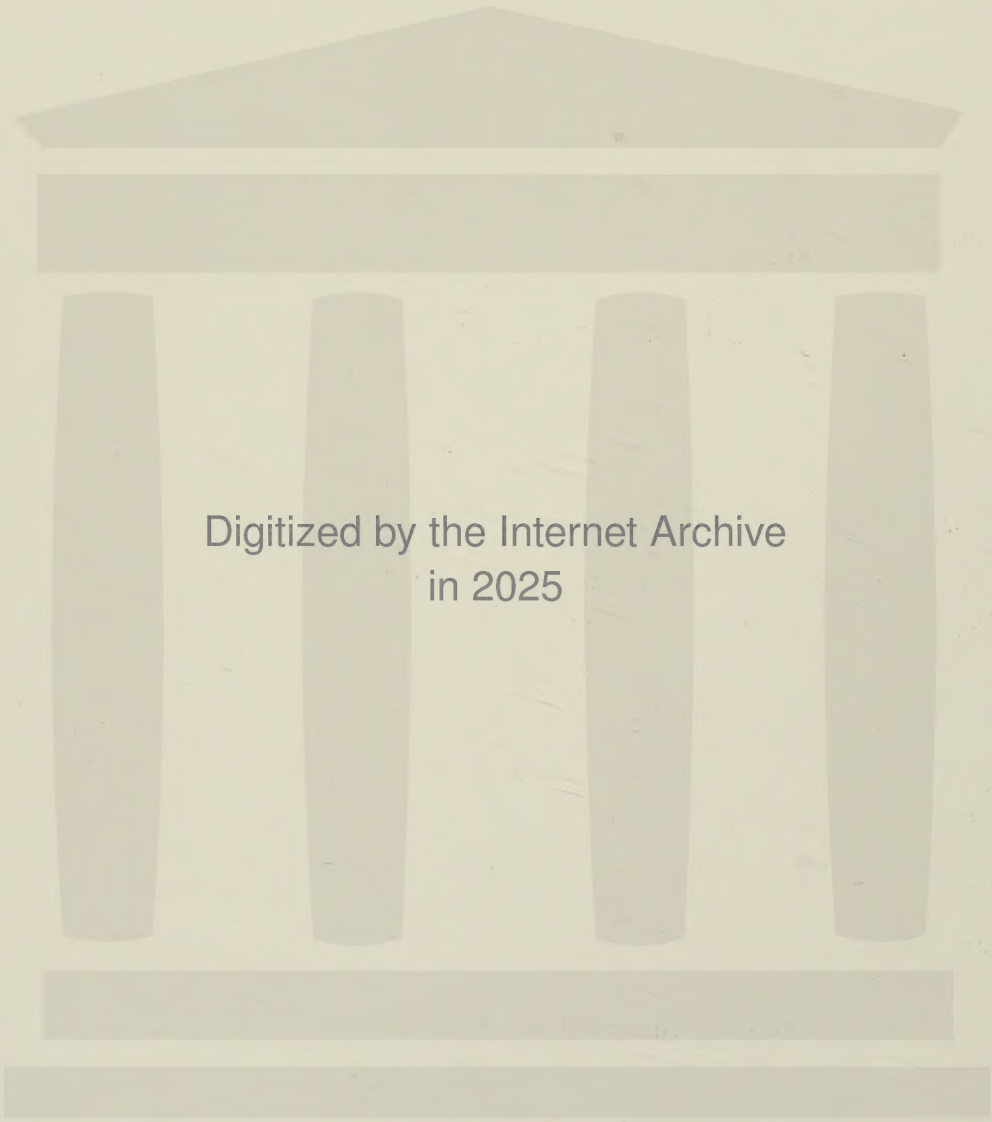

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SOUTHWEST FISHERIES CENTER
La Jolla, California

Honolulu Laboratory
La Jolla Laboratory
Tiburon Laboratory

MONTHLY REPORT - JANUARY 1976

STATUS OF PUBLICATIONS

Published

Hobson, Edmund S. 1976. The rock wrasse, Halichoeres semicinctus, as a cleaner fish. Calif. Fish Game 62(1): 73-78.

What may have been one individual rock wrasse was observed over 10 months cleaning other fishes at Santa Catalina Island. Cleaning, which is the removal of ectoparasites and other injurious materials from the bodies of other animals, is an insignificant activity for this species in general, but was a major activity of the individual involved in each of these observations. Cleaning activity of the rock wrasse is similar in most respects to that of its relative, the señorita, Oxyjulis californica.

Approved by Center Director

Sakagawa, Gary T., Atilio L. Coan and Eugene P. Holzapfel. "Length composition of yellowfin, skipjack, and bigeye tunas caught in the eastern tropical Atlantic by American purse seiners." For publication in NOAA Technical Report.

Perrin, William F. and J. Steven Leatherwood. "Fraser's dolphin, Lagenodelphis hosei Fraser, 1956." For publication as a chapter in Hankbook of Marine Mammals.

Bertelsen, E. and Paul Struhsaker. "The ceratioid fishes of the genus Thamatichthys. Osteology, relationships, distribution, and biology." For publication in Galathea Reports, Danish Science Press.

This report does not constitute publication and is for information only.

HONOLULU LABORATORY

FISH ENVIRONMENT INVESTIGATIONS

Responses of Tunas to Decreasing Oxygen Gradients Tested

Direct measurement of the responses of tunas to environmental factors by the Honolulu Laboratory's Experimental Ecology of Tunas group provides input data for predictive models of tuna habitat, distribution, and availability. Recently work has proceeded on experiments to measure 1) behavioral responses of skipjack and yellowfin tunas encountering decreasing oxygen gradients, 2) temperature preference of free-swimming tunas, 3) responses of tunas to olfactory cues, and 4) heat loss through the body surface of restrained skipjack tuna, and on an improvement to the aeration system of the Kewalo Research Facility.

Recent work on temperature and oxygen requirements for skipjack tuna formulated three environmental conditions that determine distribution: 1) a lower temperature limit of 18° C, 2) a lower oxygen limit of about 5.0 ppm, and 3) an upper temperature limit dependent on size. The lower oxygen limit was formulated on the basis of the abilities of skipjack tuna to survive in low oxygen water. Pairs of skipjack tuna were placed into a tank containing sea water of various O_2 concentrations; survival time was measured. Stress effects caused by the handling and the abrupt introduction into anoxic water were a concern. It was reasoned that if oxygen was reduced slowly, more meaningful responses could be observed and a more realistic lower oxygen limit obtained. Consequently, skipjack and yellowfin tunas were tested in the partially operational behavioral thermoregulation tank and confronted with slowly decreasing oxygen--0.6 ppm/min. At or about 4 ppm, the skipjack tuna demonstrated an abrupt increase in swim speed. In most fish tested, swim speeds increased from basal levels of about 1.6 lengths/sec to over 2.0 lengths/sec at about 3.5 ppm and 2.4 lengths/sec at 2.5 ppm. Yellowfin tuna, in contrast, showed no alteration in swim speed as oxygen decreased to about 1.5 ppm. Yellowfin tuna did not appear to be unduly stressed at these levels. Two survived and made no discernible behavioral responses during exposure to 1.4 and 1.6 ppm water for 200 min.

Increased swim speeds in the skipjack tuna coupled with directed behavior should serve to remove the fish from suboptimal areas. Within the skipjack tuna habitat, water deficient in oxygen is found below the thermocline; appropriate escape behavior would, of course, be to swim up, out of the anaerobic water. Increased speeds alone should cause the fish to rise due to increased lift on its pectoral fins.

Faster swim speeds, however, do not seem to be a response to increase ram ventilation (open-mouthed swimming). Increased flow over the gills (which provides for more oxygen delivery) is more than offset by increased respiratory demands imposed by faster swimming.

Temperature Preference in Free-Swimming Tuna

The behavioral thermoregulation tank system is again completed. During the calibration procedures, a heater case pitted and leaked and allowed salt water into the electrical circuitry causing some damage. The heater elements have since been coated with epoxy to attempt to eliminate the corrosion. Also, individual heater elements have been fused to avoid any damage due to future failures. Calibration procedures will resume this week.

Responses of Tunas to Olfactory Cues Studied

Mr. Walter Ikehara, Research Assistant with the Hawaii Institute of Marine Biology, is continuing his studies of the responses of tunas to natural and synthetic odors. Tests with amino acids and amino acid mixtures were largely negative. Aspartic acid, glutamic acid, glycine, and leucine all produced no response. Mixtures of amino acids in proportions similar to that of fish mucus also were ineffective. Natural odors, in contrast, produced dramatic and appropriate search behavior. Future work will concentrate on determining the ability of washes of various baitfishes to stimulate search and feeding frenzy behavior.

Rate of Body Surface Heat Loss Measured in Tunas

Muscle core temperature of fishes is a very important physiological parameter; it determines the upper tolerance temperature of the habitat, the maximum sustainable activity, and the likelihood of deterioration of tissue after catch. Prediction of deep muscle temperature can be made if one knows the rate of heat production (dependent on activity) and rate of heat loss. Heat loss is, however, very difficult to model. Consequently, the Experimental Ecology of Tunas group has begun to empirically determine rate of heat loss from various areas of the body. Mr. Richard Brill, Research Assistant with the Department of Physiology, University of Hawaii, has recently completed direct measurements of the loss rates from restrained skipjack tuna. Estimates of the portion of metabolic heat loss through the body surface (as opposed to loss via the gills) ranged from 18 to 45%. Future plans involve heat loss measurements from free-swimming or forced-swum fish.

Upgrading of Kewalo Research Facility

Due to the nature of the existing aeration system at the Honolulu Laboratory's Kewalo facility, dissolved oxygen of the sea water only reaches about 80% saturation. Mr. Randolph Chang is currently designing

and building a scale version of a "U"-tube aeration device that should bring dissolved oxygen to 100% saturation. If the model is successful, implementation of a full-scale version will be attempted.

Cooperative Tagging Research with Honolulu Laboratory Proposed

The Board of Governors of the Hawaiian International Allison Tuna Tournament (HIATT) initiated a proposal of a cooperative research venture with the Honolulu Laboratory. The research activity agreed upon is the defining of movements of large yellowfin tuna in waters off Oahu, primarily leeward Oahu, by tracking experiments. The Honolulu Laboratory will provide the tracking equipment, tags, and tracking personnel. HIATT will provide an appropriate boat and the personnel to run the boat. Tracking will be for 7 to 10 days. Fishery Biologist Heeny Yuen of the Honolulu Laboratory is investigating sources of tags.

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Mr. H. Yuen has developed a plan for the computer analysis of longline data on billfishes of the Pacific and Indian Oceans. He has also organized a paper on the night handline fishery for tunas (ika-sibi) of Hilo, Hawaii. Data collection for the manuscript is almost complete.

TUNA ASSESSMENT AND DEVELOPMENT INVESTIGATIONS

Recommendation Made for Collection and Processing of Hawaii Fishery Statistics

Fishery Biologist Richard Uchida, together with Mmes. Sally Kuba and Lucille Tsukano of Technical Services, met with Mr. Fletcher Riggs, Fishery Biologist of the Hawaii Division of Fish and Game, to discuss ways of improving the processing of the State of Hawaii fishery statistics. Among the recommendations made to Mr. Riggs were to return to the former system of coding each vessel so that fish catch data, when transferred to punch cards, can be identified by vessel code; and to punch the year in addition to month and day on each bait card.

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Mr. Uchida has been revising his manuscript "Status of knowledge on the biology and resources of the frigate mackerel, genus Auxis," prepared as a background document for the Workshop of FAO Ad Hoc Committee to review the biology and status of stocks of small tunas.

Task Leader Dr. Robert A. Skillman worked on revising his manuscript "Von Bertalanffy growth curves for striped marlin, Tetrapturus

audax, and blue marlin, Makaira nigricans, in the central North Pacific Ocean", accepted for publication in the NMFS Fishery Bulletin.

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At the request of Dr. N. V. Parin at the P.O. Shirshov Institute of Oceanology, Moscow, U.S.S.R., Research Assistant Tom Kazama shipped him the Laboratory's entire collection of flyingfishes. This collection dates back to 1950 and comprises about 320 specimens in 146 lots.

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The lobster catches taken during the October-November 1975 cruise of the Townsend Cromwell to the Northwest Hawaiian Islands have aroused interest within the local fishing fleet. Dr. Paul Struhsaker met with the owner/captains of the fishing vessels Pursuit and Libra and provided them with catch information and length-frequency and sex ratio data.

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The January 1976 catch of skipjack tuna in the Hawaiian fishery was an estimated 157.3 metric tons (MT), which was 13.8 MT below the catch for January 1975, and 27.3 MT more than the January average for 1948-75.

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Pulou Niuatoa, employee of the Government of American Samoa, recorded the lengths of 780 albacore from 17 vessels unloading in Pago Pago from December 20, 1975 to January 16, 1976. He also collected 14 sets of catch and effort data. Utilizing data from five vessels only, an average albacore size of 92.3 cm was determined and an albacore catch per 100 hooks of 1.33.

LA JOLLA LABORATORY

Coastal Fisheries Resources Division

ALBACORE FISHERIES PROGRAM

Studies Indicate Upwelling Temperature Fronts Influence Local Concentration of Albacore Tuna

Dr. R. Michael Laurs completed a final draft of a manuscript entitled "Study of the small-scale movements of albacore Thunnus alalunga (Bonnaterre)

using ultrasonic tracking techniques" which he plans to publish in collaboration with Heeny Yuen, SWFC, Honolulu Laboratory and James H. Johnson, NWFC, Seattle, Washington. Studies employing ultrasonic tracking techniques and oceanographic sampling demonstrated that oceanographic conditions play an important role in the local concentrations and movements of albacore in U.S. coastal waters. Upwelling temperature fronts appear to influence the local concentration of albacore, with albacore tending to congregate in the vicinity of upwelling fronts, presumably to feed, and move away from the immediate area when upwelling ceases and the upwelling front is no longer present at the surface. The movements of albacore also appear to be related to the distribution of sea surface temperature with fish spending little time in water with surface temperatures cooler than 15.0° C. The average swimming speed for three fish tracked between 27.8 and 50 hours was 1.6 knots (82.4 cm/sec) with each fish exhibiting slightly faster swimming speeds during hours of daylight than during hours of darkness.

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Dr. J. Wetherall, Fishery Biologist, Honolulu Laboratory, worked with Dr. Laurs at the La Jolla Laboratory during the second week in January on an analysis of albacore growth based on tag returns from the joint NMFS-AFRF albacore tagging program. Considerable progress was made in the analysis of the growth parameters for North Pacific albacore using standard procedures and a new method that accounts for tagging on growth rate.

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At the invitation of the Seattle District of the Western Fishboat Owners Association, Dr. Laurs gave a presentation on January 11 concerning results obtained during the joint NMFS-AFRF albacore studies conducted during 1975. He discussed the results from the early-season offshore studies, scouting and research activities carried on in inshore waters during the 1975 season, the albacore tagging program, and albacore trolling exploration carried on in the western North Pacific. His presentation was well-received and generated much discussion. About 50 albacore fishermen attended the meeting.

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Mr. R. Lynn continued work on a manuscript which he and Dr. Laurs plan to publish on the offshore distribution and relative abundance of albacore during early season and the migration routes followed by albacore into North American waters.

RECREATIONAL FISHERIES PROGRAM

Rockfish Life Histories Studied

Rockfish species collectively are the most frequently caught species taken by the various marine recreational fisheries of southern California. In spite of their importance, very little is known about their life histories and population dynamics in southern California. Fishery Biologist John MacGregor of the La Jolla Laboratory, working with California Department of Fish and Game (CF&G) biologists, has begun to examine rockfish samples collected by CF&G partyboat sampling program. The purpose of this study is to obtain some of the basic data necessary to understand the life histories of the various species and to determine what problems are developing or may develop owing to the increasing fishing pressure directed at some of the species found in this region.

Studies May Answer Question of Bonito "Residency" in Southern California Waters

Mr. A. MacCall, Biologist with the CF&G detailed to the La Jolla Laboratory, has derived a preliminary spawner-recruit relationship for Pacific bonito from the aerial survey day index of abundance (Squire, 1972) as an index of spawning biomass in the following spring, and from partyboat catch per angler as an index of recruitment resulting from spawning in the previous year. Length frequency from the two fisheries support this interpretation. The spawner index was reduced by a factor proportional to the California commercial catch, since it is removed from the population before spawning occurs. No functional curve is apparent in the spawner-recruit relationship, but two pieces of significant information can be inferred. First, the ratio of recruits per spawner is higher in the years of low biomass after the commercial fishery expanded in 1966 than in the years of high biomass before the fishery. This suggests that the population may have been able to sustain itself at fairly high abundance had the fishery not occurred. The second observation is that the ratio of recruits per spawner for 1973 and 1974 spawnings is much lower than any observed in the preceding time series, indicating that the population would likely have suffered a decline in the mid 1970's in any case. Spawning success in the next few years may give the answer to the question of whether the bonito have achieved "residency" in southern California waters.

Anchovy Growth and Mortality Inferred from Sedimentary Scale Deposits

Mr. A. MacCall, CF&G, has completed a manuscript entitled "Northern anchovy (Engraulis mordax) growth and mortality rates inferred from sedimentary scale deposits." Mortality and growth rates were estimated

by comparing the width frequency of actual scales recovered from anaerobic sediments (furnished by A. Soutar of SIO) with the frequencies obtained from computer simulated populations. The population was simulated for a range of growth and mortality rates from the literature describing the present population. Both Chi-square and Kolmogorov-Smirnov methods were used to give a statistical measure of goodness-of-fit, with both methods giving nearly identical results. It is difficult to separate the effects of growth from the effects of mortality; the method generates a response surface of likelihoods of simultaneous growth and mortality rates.

For scales recovered from Santa Barbara basin sediments corresponding to the period from 1820 to 1970 A.D., in which the mean scale deposition rate (MSDR) is 13.3 scales/1,000 cm^2/year, a "best" value of M under the "standard" growth curve given by Spratt (1975, CF&G 61(3): 116-126) was 0.96. For two cores containing older sediments covering the approximate period 200 to 1850 A.D., with respective MSDRs of 33.4 and 30.4, M values of 1.17 and 1.37 were obtained, indicating a possibly higher mortality rate for that period. An alternative hypothesis is that growth may have been slower due to the large population sizes which can be inferred from the MSDR values. Values of M for a "low" growth curve (standard parameters less one standard error) are 0.90 and 1.06 respectively, showing little change in mortality rate under this hypothesis. Ranges of fit, within which the probability of obtaining the value of the Chi-square statistic given that the simulation describes the true population is 0.10 or greater, tend to be $M \pm 0.25$. These estimates of M agree with independent published estimates of M = 1.0.

Dividing the 1820 to 1970 scales into periods of high and low deposition rate of anchovy scales yielded little difference between the two width distributions, although MSDR for the two groups were 16.8 and 9.7, respectively. Division of the same group of scales into periods of high and low sardine scale deposition rate yielded quite different scale width distributions, suggesting possible interspecific competition for food.

STOCK AND RECRUITMENT PROGRAM

Colloquium Report on Larval Fish Mortality Nears Publication

Report of a colloquium on larval fish mortality studies and their relation to fishery research held in January 1975 at the SWFC is now in galley form and will soon be published as a NOAA Technical Report, NMFS Circular. The report summarizes the discussions of experts on how studies of larval fish mortality may help in determining how the abundance of adult fishes affect the strength of incoming year classes. Included in this report are discussions of the principal causes of larval

mortality and their possible relation to stock size. Guidelines and recommendations are made regarding future research on the mortality of larval fish.

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Dr. J. Hunter, Fishery Biologist, and Ms. C. Sanchez, Biological Technician at the La Jolla Laboratory, report that they began rearing anchovy larvae at 13° C this month which is near the minimum temperature for these larvae. The object of this work is part of a continuing effort to determine the temperature coefficient for growth and to correlate these data with daily growth rings on the otoliths so that growth and mortality can be estimated for sea-caught specimens.

Hunter and Sanchez also submitted to the Fishery Bulletin a manuscript entitled "Diel changes in swimbladder inflation of the larvae of the northern anchovy, Engraulis mordax Girard."

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Dr. A. Alvariño, Fishery Biologist at the La Jolla Laboratory, departed this month for Mexico City where she has been invited to give a course on "Plankton and Fisheries" at the University of Mexico (U.N.A.M.). She was also nominated to life membership in the Association of Latin-American Researchers in Oceanic Sciences.

Microdistribution Experiments Planned for Multi-Vessel Cruise in March

Dr. Robert Owen, Oceanographer at the La Jolla Laboratory who is coordinating the microdistribution experiments to be conducted in March aboard the NOAA research vessels Jordan and Cromwell and the Agassiz of SIO, completed plans for vessel deployment and experiments which are designed to yield new information on small-scale ($\geq$ 20 cm) variations of organisms and particles, the inter-relation of zooplankton, phytoplankton and fish larvae, and causative mechanisms.

Jordan and Cromwell, carrying researchers from the NMFS and Food Chain Research Group (FCRG) of SIO, will be working on the continental slope and shelf off Cardiff, California, under conditions representative of such areas in the southern California Bight during the peak spawning period of the anchovy. Agassiz, carrying additional FCRG workers, will join the NMFS vessels after completing a broader scale cruise in the Bight to conduct additional experiments on the generation and maintenance of the chlorophyll maximum layer. Variations of this layer may control anchovy recruitment because larval anchovy feed on organisms which make up the layer.

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Mr. Victor Chow, Biological Technician working with Dr. Owen at the La Jolla Laboratory, enumerated selected species from a set of phytoplankton samples obtained with the microprofile sampler last September. They found that some species, e.g., Prorocentrum micans varied in concentration by as much as threefold over 20 cm intervals, and over sixfold over a meter interval in the chlorophyll maximum layer.

Mr. Chow also analyzed plant pigment samples taken during pump profiles on a September cruise.

Study Continues of Histological Features of Fed and Starved, Laboratory-Reared Jack Mackerel Larvae

Ms. Gail Theilacker, Fishery Biologist at La Jolla, continues to study the histological features of fed and starved, laboratory-reared jack mackerel larvae. At about 15° C, jack mackerel larvae begin to feed on day 6. By day 8, most of the fed and starved larvae that have been examined still have yolk reserves. However, those in the starved condition exhibit visible tissue degeneration. As with the anchovy larvae studied by Dr. C. O'Connell, the pancreas is significantly affected by food deprivation. The appearance of several other tissues in the mackerel larvae also seems to be related to starvation: 1) brain nuclei becomes dark and shrinks, 2) muscle fibers separate, 3) liver and gut nuclei are irregular and indistinct, and 4) the kidney cytoplasm shrinks. Of these histological criteria, the changes in the pancreas, brain and muscle tissue seem to be consistent and the easiest to detect in starved larvae. However, the extent of the condition varies within individuals and with the duration of starvation.

ECOLOGY OF THE CALIFORNIA CURRENT PROGRAM

Life History Studies of Rockfish and Flatfish in Progress

Dr. E. Ahlstrom, Senior Scientist at the La Jolla Laboratory, reports that Dr. Moser, Fishery Biologist, continues to study a series of larvae and juveniles of Sebastes melanostomus for a life history series of this widely distributed rockfish. The juveniles are commonly collected in midwater trawl hauls and this species is one of several rockfishes that has a fairly extended pelagic juvenile stage.

Flatfish larvae are also being studied in order to work up life history series. Recent emphasis has been placed in studying forms that are heavily pigmented as larvae, including Pleuronichthys (four species) Hypsopsetta guttulata and Hippoglossina stomata.

Larvae of several of these are strikingly similar in appearance, especially prior to fin formation. The task of researchers is to find small differences that will permit precise identification of these larvae to species.

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Dr. Ahlstrom has concentrated on assembling the background information that will be given to participants in his course on identification of fish eggs and larvae, to be held March 22 to April 16. Dr. Ahlstrom plans to cover 216 life history series in the course and for most of these, illustrations will be made available. Betsy Stevens has been working with the specimens to be studied in the above life history series, replacing specimens that are damaged or bleached with fresher material.

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Currently, according to Dr. Ahlstrom, only one manuscript was being edited in January prior to final typing--"Pelagic stromateoid fishes of the eastern Pacific: kinds, distributions, and early life histories," by Ahlstrom, Butler and Sumida.

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Schlieren Optical System Used to Study Larval Fish Behavior

Dr. J. Taylor, sponsored by the National Science Foundation in collaboration with Drs. R. Lasker and J. Hunter, has constructed a Schlieren optical system which is currently being used to study the behavior of larval fishes. High speed motion pictures of feeding behavior in larval anchovies and Pacific mackerel are now routine. Through the use of a low speed, high resolution film, and operating the Schlieren in its bright field configuration, it is possible to use frame rates of 100 frames per second or higher, with an exposure time of only 1/3500 second. This combination of frame rate and exposure is entirely satisfactory for analysis of the films, and does not require special processing techniques.

Since the Schlieren system permits visualization and photography of both thermal and salinity gradients in the sample tank, it is possible to study two additional behavioral phenomena. First, by establishing

a controlled gradient in the tank one may record the tropistic responses of organisms confronted with a thermal or salinity change. Second, the perturbations of a gradient, especially of a sharp boundary, may be observed and recorded. The latter property of the system suggests that the swimming dynamics of certain marine forms (e.g., copepods) may be elucidated by this method.

The first successful color Schlieren photographs have been made. In this technique the conventional aperture is replaced by a color zone plate in which concentrically mounted filters are placed at the image plane of the source. Refractive index gradients in the sample tank are thus encoded into color differences in the Schlieren image.

Oceanic Fisheries Resources Division

TUNA RESOURCES PROGRAM

Atlantic-Caught Tunas by Foreign Vessels Sampled in Puerto Rico

Compilation of statistics on length-frequency distributions and species composition of 1975 landings of Atlantic-caught tunas by foreign vessels was started during the month by Fishery Biologist Ted Murphy of the La Jolla Laboratory. The statistics were collected in Puerto Rico from April to December, 1975, by Biological Technician Eugene Holzapfel. About 5,700 fish were measured from landings of albacore, bigeye, skipjack and yellowfin:

Species	Tonnage (metric tons)	Number of fish sampled
Albacore	3,444	543
Bigeye	129	105
Skipjack	5,275	1,911
Yellowfin	2,465	3,141
Total	11,313	5,700

About 70 species composition samples were drawn from the yellowfin tuna landings. These samples are collected to determine the amount of bigeye tuna that are landed as yellowfin tuna, since landings of both species are reported as yellowfin tuna. The amount of bigeye tuna mixed in the yellowfin tuna landings range from 0 to 16%.

Preliminary 1975 Data Compiled on Tuna Catches from American Tuna Seiners that Participated in Eastern Tropical Atlantic Tuna Fishery

Preliminary estimates of 1975 tuna catches for American vessels that participated in the 1975 eastern tropical Atlantic tuna fishery

are tabulated, according to Mathematician Al Coan of the La Jolla Laboratory. The fleet of 30 seiners caught an estimated 13,500 metric tons (MT) of yellowfin tuna, 6,500 MT of skipjack tuna, and 60 MT of bigeye tuna.

Length-frequency samples were collected by personnel of the Inter-American Tropical Tuna Commission, under contract arrangements with the National Marine Fisheries Service, from the catch of U.S. seiners; 104 samples were collected. The approximate catch sampled and number of samples taken by species are as follows:

Species	Approximate tonnage samples	Number of samples (approximately 50 fish/sample)
Yellowfin	2,600	58
Skipjack	1,300	38
Little Tunny	40	4
Bigeye	40	2
Other	20	1
Total	3,300	104

Preliminary data on catch and effort and length-frequency by species from the American fleet have been summarized for distribution to scientists of member countries of the International Commission for the Conservation of Atlantic Tunas, and to U.S. fishermen.

Readers of Fishing Information Comments are Favorable

Fishery Biologist James Renner, at the La Jolla Laboratory, editor of the monthly SWFC publication, Fishing Information, has compiled statistics from the readership survey conducted during the fall of 1975. The survey was conducted both for the purposes of renewing the mailing list and to garner some user evaluations of various aspects of the Fishing Information publication. The 548 responses received to date fall into the following categories:

	Numbers	Percent
Commercial fishing	181	33
Recreational fishing	64	12
Fish processing	18	3
Fishery research	52	10
Oceanography	56	10
Meteorology	33	6
Other	144	26

The "Other" category includes those respondents who named a business or activity not listed on the form or who checked more than one category.

Forty-two of the "other" responses can be identified with some type of fishing, so the total response by fishermen (including commercial and recreational) was 287, or 52% of the respondents. The response from scientific researchers of all types was 193, or 35%.

Responses to the questions revealed that all three parts of Fishing Information (monthly issues, 15-day charts and Albacore Bulletin) are about equally valued by the readers. Most respondents find the monthly narrative, "Sea surface temperature and environmental conditions" to be very helpful or moderately helpful. Finally, no overwhelming support was forthcoming to either (a) speed up the mailing schedule for Fishing Information, or (b) issue the monthly charts in a quarterly or annual collection.

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Incoming marine weather observations formerly acquired at the La Jolla Laboratory via circuits 1GT8275 and 8276 to support ongoing research are now received via circuit 1GT6052. This transformation took place in mid-October out of necessity since the former circuits were being discontinued from service. Mark Sweeney, Communications Specialist, reports the new circuit is operating very well now that a problem area has been isolated and corrected at the input terminal. Other supporting activities remain the same.

Tuna Vessels Participate in FAX Program

During January, 31 U.S. seiners participated in the FAX program of the La Jolla Laboratory. Reporting rates for January were down from January 1975 by 60.8% as shown below.

January Reporting Rates

	Weather observations	XBT observations	Total
1975	349	69	418
1976	136	28	164
Percent change	-61.0%	-59.4%	-60.8%

The reporting rate for January represents the lowest total for the first month of the year since 1971 when only three boats were enrolled in the program.

The sharp decline in the reporting rate appears to be the result of several factors. First, the boats got a late start as a result of price/contract negotiations. Second, many of the boats are fishing south of

the equator off the Gulf of Guayaquil in an area of marginal radio coverage. Third, many of the fishermen are dissatisfied with the weather charts provided by the National Weather Service Forecast Office, Redwood City, California.

The tuna seiner Cheryl Marie led cooperating vessels in January with seven weather and nine XBT observations sent to the Southwest Fisheries Center.

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During the month of January, FAX program equipment was removed from three purse seiners due to their failure to send in environmental data. Two units were removed by Mark Sweeney, Communications Specialist, in San Diego and the remaining unit was removed by Gene Holzapfel, Biological Technician, in Mayaguez, Puerto Rico. Equipment removals are planned for four other seiners as soon as they are available at dockside. In addition to the above, Mr. Sweeney installed six facsimile units and one XBT recorder on cooperating purse seiners.

TUNA/PORPOISE PROGRAM

NOAA Research Vessels Continue Survey of Porpoise Distribution Boundaries

As noted in an earlier monthly report, the NOAA research vessels, Jordan and Cromwell, have been engaged, since January 5, in conducting a joint survey of the boundaries of offshore porpoise distributions in the eastern tropical Pacific. Of particular interest are the spotted and spinner porpoises, the two most important species involved in the yellowfin tuna purse seine fishery in the eastern tropical Pacific. The Jordan, under the scientific leadership of Dr. E. Barham and the Cromwell with Dr. D. Au as Cruise Leader have both maintained an intensive schedule of marine mammal watches as well as regular bathythermograph stations. Daytime observations were made with the ships proceeding at their fastest practical speed to cover the required distance during daylight, and also to insure enough time for deviations from the chart track to approach and identify porpoise schools.

About 2 hours each night have been spent on biological sampling consisting of hauls with the Cobb pelagic trawl on the Cromwell, Isaacs-Kid trawl on the Jordan, and of night-light sampling for squid and fish on both vessels.

Daily radio reports have been sent to the Center via radio station WWD. The vessels found one school of spotters and spinners at 4° S. This sighting is about 200 miles south of the southernmost sighting of spotters previously reported in offshore waters.

After refueling in Puntarenas, Costa Rica, both vessels are heading for San Diego along tracks based on the results of the first leg of the cruise. Dr. W. Fox has indicated that after leaving Costa Rica, one vessel will head further south than on the original approach and then travel back north through the middle of the fishing grounds. The other vessel will travel west and north to obtain a gradient along the northern fringe of the traditional tuna fishery. The information derived from this joint cruise will be used to refine estimates of population size of offshore spotted dolphin and eastern spinner dolphin.

Both vessels are expected to return to San Diego about March 3.

Plans Made to Fleet-Test Complete Array of Porpoise-Saving Gear

A major goal of the NMFS research program at the La Jolla Laboratory on the porpoise/tuna interaction is to develop improved fishing gear and techniques to reduce the incidental mortality of porpoise during commercial tuna purse seining operations. To this end, the NMFS Southwest Fisheries Center chartered the M/V Bold Contender and the M/V Eastern Pacific during the fall of 1975 to test and evaluate the efficiency of various fishing gear under actual fishing conditions. According to Drs. Fox and Lenarz of the La Jolla Laboratory, the results obtained were particularly encouraging and significant. An extremely low rate of porpoise mortality was achieved by the Bold Contender through use of a total system consisting of speed boats to hold the purse seine open, porpoise apron, porpoise chute, extended length porpoise safety panel using small mesh to avoid entanglement of porpoise, a rubber raft to aid in backing down, and hand release of porpoise. It has been estimated that about a 10-fold decrease in the mortality per set was attained as compared with the fleet-wide average. The Eastern Pacific, without as much small mesh webbing or the porpoise chute, had about half the mortality per set as the fleet average and reduced its previous mortality rate even more significantly. Dr. Fox cautioned that these are only two trips and operated as charters, and more testing is required. The data also need to be analyzed in more detail.

In order to test this system further, the Bold Contender departed during the first week in January for the tuna fishing grounds in the eastern tropical Pacific equipped with the same experimental gear and a NMFS gear technician aboard to record the results with use of the year. Shortly, thereafter, the purse seiner, Eastern Pacific, outfitted as before, left San Diego for the tuna fishing grounds.

Further plans for fleet-testing what is commonly referred to as the "Bold Contender" system were developed on January 7 at a meeting held at the Center and a decision was made to place NMFS gear technicians aboard 19 U.S. tuna purse seiners during May-June, 1976. Nine

vessels will use the "Bold Contender" system furnished by NMFS and 10 vessels will use a modification that relies on extensive small mesh webbing provided by the tuna industry's Porpoise Foundation as its principal rescue feature.

Methodology Being Developed for Comparing Incidental Porpoise Mortality of 1975 with 1976

The 1976 regulations concerning the incidental mortality of porpoise which were published December 5, 1975, in the Federal Register require that a determination be made whether or not "... the total number of porpoise deaths for the year is projected to exceed 70% of the final estimated 1975 kill." Two meetings, December 12 and January 8, were held at the Center between scientific and technical representatives of the Marine Mammal Commission, Living Marine Resources, and the National Marine Fisheries Service to develop the methodology required for comparing porpoise mortality of 1975 with that of 1976 in order to make a determination consistent with the 1976 regulations. Also in attendance at the January meeting were representatives of Fund for Animals and Project Monitor.

John Everett is New Leader of Porpoise/Tuna Program

Mr. John Everett entered on duty at the La Jolla Laboratory on January 23 as a replacement for Dr. W. Lenarz as leader of the Porpoise/Tuna Interaction program. Dr. Lenarz is transferring to the Tiburon Laboratory about April 1st where he will be assigned to the newly-implemented Rockfish Analysis Task.

Mr. Everett was formerly on the Program Planning and Evaluation Staff in the Office of Resource Research, Washington, D.C.

TIBURON LABORATORY

COASTAL FISH COMMUNITIES INVESTIGATIONS

Insight Into Behavior of Certain Fish Species Obtained from Analysis of Predator-Prey Interactions in Algal-Field Habitat

Having completed their analysis of data from the sandy bottom habitat at Catalina Island, Dr. E. Hobson, Project Leader, and Fishery Biologist T. Chess at the Tiburon Laboratory, turned their attention to collections from the fields of low brown algae that lie adjacent to many kelp forests. Important biological interactions occur between these two habitats. The kelp bass, probably the major recreational species in the forests as an adult, is numerous in the adjacent fields as a juvenile. Large kelp bass prey mostly on smaller fishes, but juveniles prey almost entirely on small crustaceans that abound on

algae (e.g., amphipods), or in the lower regions of the water column (esp. copepods). These prey are more numerous in the fields than on the comparatively barren floors of the forests, and sea-floor cover for a small fish is closer at hand in the fields.

Many of the organisms that juvenile kelp bass take from the algae by day rise into the water column at night (e.g., certain amphipods). At this time they become prey for certain kelp-forest inhabitants that move over the fields only after dark. Prominent among these nocturnal foragers are large juveniles of the olive rockfish, Sebastes serranoides. (A similar nocturnal feeding migration of other kelp-forest fishes over the sandy botton habitat was described earlier.)

PHYSIOLOGY INVESTIGATIONS

Meeting Held on Striped Bass Conceptual Model

Mr. M. Eldridge, Fishery Biologist at the Tiburon Laboratory, attended the third meeting of a four-agency committee on January 13 to develop a striped bass conceptual model. The meeting was held in the California Department of Fish and Game's Stockton office. The committee revised a draft of the model and devised a new format for its presentation. Factors affecting mortality at different life stages were ranked according to their relative importance. The next meeting is scheduled for February 10. The staff of the Physiology Investigations at Tiburon continued preliminary preparations for the striped bass mortality study. Culture containers were tested and details of the experimental design planned.

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Mr. Pete Benville, Chemist, reported that an Endex-Oasis literature search was begun for research on pollution effects on striped bass. Lt. Rich Faris, Computer Specialist, has made searches of three abstracts; however, at this time only information from Biological Abstracts has been received.

COASTAL FISHERIES INVESTIGATION

Rockfish Analysis Task Implemented at Tiburon Laboratory

The rockfish group, mainly comprised of species of Sebastes, contributes heavily to the fisheries of California and other Pacific coast states. Generally not separated by species in catch statistics, rockfishes as a group are first in the recreational partyboat catch in

both weight and numbers caught, second in California commercial landings of market fish, and comprise a substantial portion of the foreign fleet catch taken off the Pacific coast. The Rockfish Analysis Task was implemented at Tiburon, to start to provide information necessary for managing stocks of rockfishes.

Mr. S. Kato, Leader of the Task, reports that Operations Analyst P. Adams began working on the Task on January 2. His primary duty is directed toward development of a multi-species management model for rockfishes.

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A meeting was held at the Tiburon Laboratory on January 13 with J. Baxter and T. Jow of the California Department of Fish and Game, to discuss cooperative work on rockfishes. It is hoped to let a contract to the CF&G to obtain catch and effort data from the California partyboat fleet.

New Brood of Coho Salmon Received for Pen-Rearing

Mr. R. Green, Fishery Biologist at the Tiburon Laboratory, reported that 30,000 coho salmon, averaging 7.3 fish per pound were delivered by the California Department of Fish and Game this month from their San Joaquin hatchery. This is the brood that the Tiburon Laboratory intended to take in late February or early March but it was delivered early because of an outbreak of fresh-water parasitic copepods and fungus. It was feared that the infection would spread throughout the hatchery, so all affected salmon were removed early. It is anticipated that the move from fresh to salt water will eliminate the infectious organisms. The fish were generally in good health when delivered on January 16. Initial and subsequent mortality has been quite low and there is no further evidence of the infectious organisms.

Because of the short notice, it was impossible to inoculate against vibrio, the most common disease of coho salmon. Newly-inoculated fish must spend 10 more days in fresh water before being transferred to salt water. As an alternative precaution, the fish were placed on a standard 10-day diet of Terramycin additive in their food. The young fish were temporarily placed in two 10,000-gallon pools until the modified net pens can be reassembled.

Current progress and future plans for the salmon rearing activity were discussed at a meeting at the Tiburon Laboratory on January 8 with representatives of the San Francisco Tyee Club, University of California Extension, and California Department of Fish and Game.

Final Corrections and Type Specifications Completed for Anglers' Guide to the U.S. Pacific Coast

The "Anglers' Guide to the U.S. Pacific Coast", co-authored by J. Squire, Fishery Biologist at La Jolla, and S. Smith, Publications Specialist at Tiburon, is an upcoming NMFS publication that describes marine game fish, fishing grounds and angler facilities all along the U.S. west coast and around Hawaii, American Samoa, and Guam. In January, Ms. Smith made final corrections on the 40 fishing charts and completed all the type specifications for the book. The type specs were sent to NMFS' Scientific Publications Staff in Seattle for review.

Also during the month, many phone and written requests for copies of the Guide, resulting from an article that appeared in The Independent Journal, a local newspaper, were received. The article described the Guide and gave information on local fishes and fishing grounds. The names of those who responded to the article will be added to the long list of people who wish to be notified when the book is published.

PUBLIC RELATIONS - SOUTHWEST FISHERIES CENTER

At the request of Dr. Duane Brown of the Department of Food Science and Technology at the University of California, Davis, Ray Sumida shipped two fresh 10-pound skipjack to Dr. Brown. The Sea Grant Program at UC, Davis is studying histamine poison in fish.

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By far the greatest number of requests made to the Honolulu Laboratory Library to non-NOAA patrons are for various publications on aquaculture. These requests come from graduate students, State of Hawaii Fish and Game, and private research agencies.

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On January 29, students from Patrick Henry High School, San Diego, and their instructor Miss Judith Reith, visited the Center to view a film on plankton in the sea and tour research facilities. Ms. L. Vlymen briefed the group on fisheries research at the Center before the tour.

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About 250 scientists, delegates to the World Mariculture Meeting in San Diego, visited the Southwest Fisheries Center in La Jolla on January 26, where Drs. E. Scura and D. Leighton conducted tours of

the sea water experimental aquarium. The Center contributed a one-page description of the aquarium to the brief book prepared for all participants by Dr. Richard Ford of San Diego State University who was in charge of arrangements for this tour.

HONORS AND AWARDS

Receiving cash awards at the La Jolla Laboratory in January, 1976, were Al Coan, Mathematician, Gary Sakagawa, Fishery Biologi t, Mark Sweeney, Communications Specialist, and Joanne Webber, Secretary. Frances Tonsich, Secretary and Lillian Vlymen, Technical Writer, received Quality Step Increases.

Effective January 4, 1976, were promotions for the following: Dr. John Hunter to Leader, Stock and Recruitment Program; Dr. William Lenarz, Leader, Porpoise/Tuna Program; Dr. Gary Sakagawa, Leader, Tuna Resources Program; Dr. Gary Stauffer, Leader, Recreational Fisheries Program, all of the La Jolla Laboratory.

SEMINARS

La Jolla Laboratory

January 12 - Dr. Peter Wiebe, Woods Hole Oceanographic Institution, Woods Hole, Massachusetts, discussed "Recent advances in zooplankton sampling."

13 - Dr. Richard Parrish, Pacific Environmental Group, Monterey, California, talked about "Environment-dependent recruitment models and exploitation simulation of the California Current stock of Pacific mackerel."

Tiburon Laboratory

January 9 - Mr. Andrew Bakun, NOAA, Pacific Environmental Group, Fleet Numerical Weather Central, Monterey, California, spoke on "The upwelling index and other factors describing eastern Pacific coastal upwelling."

15 - Mr. Tony Chess, Fishery Biologist at the Tiburon Laboratory, presented a seminar to faculty and students at California State University at Hayward on the kelp-bed habitat studies.

23 - Dr. Edmund S. Hobson, Fishery Biologist (Research), Tiburon Laboratory, Tiburon, California, talked about "Research conducted on fish behavior in the kelp-forest habitat, Santa Catalina Island, California."

MEETINGS AND TRAVEL

January 6 - The Sea Grant Advisory Subcommittee on Marine Resources Development, of which Mr. Richard Shomura, Honolulu Laboratory Director, is chairman, met to review and evaluate several project proposals. Present were Mr. Rick Gaffney, Marine Advisory Agent, Sea Grant-Maui County; Mr. Frank Goto, United Fishing Agency; Mr. Peter Hendricks, Marine Advisory Agent, Sea Grant-Hawaii County; Mr. Paul Sakuda, Amfac, Inc.,; Mr. Cliff Slater, Maui Divers of Hawaii, Ltd.; Dr. Deorge P. Wollard, Director, Hawaii Institute of Geophysics.

6 - 7 - Mr. D. Mackett, in San Francisco to attend Coast-Wide Data System Meeting.

10 - 12 - Dr. M. Laurs, La Jolla Laboratory, in Seattle, Washington, to address district meeting of the Western Fishboat Owners Association.

12 - Mr. Shomura attended the groundbreaking ceremony for the new East-West Center Program Building to be built next door to the Honolulu Laboratory.

15 - Mr. Shomura and Regional Representative Robert Iversen met with Mr. Andy Gerakas to discuss Pacific Islands Development Commission (PIDC) matters.

16 - Mr. Shomura attended an all-day Sea Grant Advisory Council meeting at the University of Hawaii Campus Center. Consensus reports of the projects' reviews were presented.

16 - Mr. Roger Green, Fishery Biologist, Tiburon Laboratory, presented a talk to the Marin Rod and Gun Club on the salmon rearing project. The Club was very interested in the project and discussed means of offering support, labor and financial aid to the project.

16 - State University System Trustees held a meeting at the Tiburon Laboratory to discuss the acquisition and utilization of excess base property.

18 - 22 - Fishery Biologist William Perrin, La Jolla Laboratory, traveled to La Paz, Mexico, for discussions of marine mammal research with officials of the Mexican government.

19 - Dr. Jeannette Struhsaker, Tiburon Laboratory, attended a meeting at the California Department of Fish and Game's Anadromous Fisheries Branch, Sacramento, California.

January

20 - Dr. P. Smith in San Pedro to confer with scientific leader on the TINRO research vessel, Poseidon, regarding final cruise plans for cooperative hake survey. Ms. L. Vlymen served as Russian interpreter at this meeting.

20 - Acting Center Director Barrett in Terminal Island to meet with Messrs. Howard and Anders regarding Center/Region matters.

20 - Mr. Shomura called a meeting of the Baitfish Committee to review the draft copy of "Invitation to bid on the tuna baitboat charter" prepared by LMR. In this connection a blanket 1-year import permit (No. 5684) to extend the introduction of about 200 buckets (80,000 fish) of northern anchovy, Engraulis mordax, for use as baitfish was requested and received from the State of Hawaii Department of Agriculture. Other Pacific Tuna Development Foundation (PTDF)-related activities were also reviewed.

20 - 23 - Mr. Norman Abramson and Mr. Susumu Kato, Tiburon Laboratory, attended a workshop on rockfish research held at the Northwest Fisheries Center. Researchers from all the western coastal states were present at the meeting. Principal items discussed were coordination of activities regarding research on rockfishes; sampling methods and gear, and collection and analysis of data.

21 - 22 - Dr. M. Laurs at the California Fish and Game Laboratory in Long Beach to work with CF&G scientists on albacore catch and effort data.

21 - 22 - In cooperation with Mr. Iversen, Mr. Shomura arranged for Mr. Ed Smith, fisheries marketing specialist with NMFS, Pascagoula, Mississippi, to meet with members of Hawaii's fishing industry. Mr. Smith is trying to develop new markets for underutilized fish species available from the Gulf of Mexico. He brought with him samples of croakers and ladyfish for possible use by the kamaboko industry in Hawaii.

26 - Mr. Shomura left Honolulu to attend the SWFC Management meeting in La Jolla on January 27 and to discuss the baitfish project with personnel at the Tiburon Laboratory on January 28. He returned to Honolulu on the 29th.

27 - Center Management Meeting at La Jolla attended by Acting Director Barrett, Mr. D. Mackett, Dr. W. Fox, Dr. R. Lasker, Mr. N. Abramson, Mr. R. Shomura, and Mr. B. Remington.

January 27 - Dr. Paul Struhsaker addressed the Maui Chapter of the American Cetacean Society on the subject of barnacle removal by humpback whales during their winter migration to Hawaiian waters.

27 - Mr. Heeny Yuen attended the Executive Committee Meeting of the Hawaiian International Allison Tuna Tournament.

30 - Mr. Tamio Otsu departed for Japan to attend the annual Japanese Tuna Conference to be held at Shimizu.

30 - Dr. Struhsaker represented the Laboratory at the meeting of members of the Department of Food Sciences of the University of Hawaii and the tuna canning industry who are concerned with the determination of histamine content in canned tunas. Honolulu Laboratory personnel will help the Department of Food Sciences prepare a project proposal and will participate in the project.

VISITORS

Honolulu Laboratory

January 8 - G. D. Vose, NOAA Ship Researcher, Miami, Florida.

15 - A. Kelly Shelton, ferro-cement boats, Singapore.

19 - Mark J. Sosin, free lance writer, Highland Park, New Jersey.

30 - G. Kenneth Alameda, Van Camp Sea Food Co., San Diego.

La Jolla Laboratory

5 - Mr. Carlos A. Vilanova, Florida Atlantic University, San Salvador, El Salvador.

8 - Mr. Roy Mendelssohn, Yale School of Forestry and Environmental Studies, New Haven, Connecticut.

12 - Messrs. J. Johnson and R. Parrish, NMFS, Pacific Environmental Group to confer with Drs. Lasker and Smith.

13 - Messrs. W. Meibohm and C. Felber, NMFS, Washington.

January 13 - Mr. Scott Metzger, Institute of Behavioral Science, University of Colorado, Boulder.

13 - 16 - Dr. Edward Mitchell, Department of Environment, Canada, St. e. Anne de Bellevue, Province of Quebec.

January 13 - February 15 - Dr. Alejandro Villamar and Ms. Elena Gonzalez, Instituto Nacional de Pesca, Mexico City.

January 15 - Mr. Joseph Pileggi, NOAA, NMFS, Washington, D.C.

Dr. Ian Hampton, Sea Fisheries Branch, Cape Town, South Africa.

16 - Dr. Joyce Hochmuth-Powell, Department of Anthropology, U.C. Irvine.

23 - Mr. Gordon D. Shadoan, NASO, Seattle.

26 - Mr. Arthur W. Haseltine, California Department of Fish and Game, Marine Culture Laboratory, Monterey.

Mr. Richard A. Neve, Institute of Marine Science, University of Alaska, Seward, Alaska.

Dr. Ted Ford, Lousiana State University Sea Grant Program, Baton Rouge, Lousiana.

Miss Linda Chaves, University of Washington College of Fisheries, Seattle, Washington.

Mr. Eugene J. Petrovich, Aquacultural Research Center, Dennis, Massachusetts.

Mr. Craig S. Wisner, Oregon State University, Corvallis, Oregon.

29 - Mr. Ray Hubley, Chief, Marine Mammals and Endangered Species Division, Washington, D.C.

Tiburon Laboratory

January 7 - James R. Payne, Bodega Marine Laboratory, Bodega Bay, California.

8 - Bruce Wyatt, U.C. Extension, Santa Rosa, California.

Bob Brown, J. Von Nostitz and Frank Dyer, Tyee Club, San Francisco, California.

January 8 - Lamar Trott, Acting Chief, Resource Research Management Division, NMFS, Washington, D.C.

9 - T. Vaughan, Oceanic Society, San Francisco, California.

Andrew Bakun, Pacific Environmental Group, Monterey, California.

Rod McInnis, Moss Landing Marine Lab, Moss Landing, California.

Haug Leland, California Department of Fish and Game, Menlo Park, California.

13 - Jack Baxter and Tom Jow, Menlo Park, California.

15 - Jack W. Gehringer, Deputy Director, National Marine Fisheries Service, Washington, D.C.

Frank Hester, Marine Biology and Fisheries, Santa Barbara, California.

16 - Mr. and Mrs. Dean Lesher, California State University Trustees, San Francisco, California.

Donald Garrity and Karl Wente, California State University Trustees, San Francisco, California.

W. O. Weissich, Wendell Watts, Bob Siken, Roy Biaphy, Jane Brayden, and Pat Dooley, California State University Trustees, San Francisco, California.

Paul Romberg, President, California State at San Francisco, San Francisco, California.

George D. Hart, California Post Secondary Commission, San Francisco, California.

23 - Jake Ours, GSA, San Francisco, California.

Kim McLeneghen and Jim Houk, California Department of Fish and Game, Monterey, California.

Gordon Chan, College of Marine, Kentfield, California.

Bill Eschmeyer and Warren Freihoffer, California Academy of Sciences, San Francisco, California.

28 - Bob Huffer, Scripps Institution of Oceanography, La Jolla, California.

January 28 - Richard Shomura, Director, Honolulu Laboratory, SWFC, Honolulu, Hawaii.

TRAINING

Mr. Bob Scruggs, Instructor, assisted by Ms. Mauna Kammer, NMFS, Washington, D.C., conducted a supervisory training course for top and middle management supervisors of the Southwest Fisheries Center, January 19-21.

PERSONNEL

		Laboratory
January	2 - Jean Hatashima, Biological Aid (Fisheries), Resignation.	Honolulu
	4 - Mr. Peter Adams, Operations Research Analyst, Appointment.	Tiburon
	5 - Barbara Engstrand, Administrative Clerk, Return to duty.	La Jolla
	6 - Charles Kokes, Biological Technician, Termination.	La Jolla
	20 - Jonathan Halas, Biological Technician, Temporary appointment.	La Jolla
	26 - Jeoffrey Lewis, Biological Aid, Pay adjustment to intermittent.	La Jolla
	27 - Bruce Wahlen, Mathematician, Temporary appointment.	La Jolla
	28 - Marian Ray, Library Aid, Extension of temporary appointment.	La Jolla
	Becky Donlan, Clerk-Typist, Extension of temporary appointment.	La Jolla

Center Director Receives Temporary Assignment to Washington, D.C. to head NMFS Extended Jurisdiction Staff

Dr. Brian Rothschild, Director, Southwest Fisheries Center, left La Jolla on January 15 to travel to Washington, D.C. where he has been assigned by NMFS Director Schoning to assume, on a temporary basis,

the leadership of the NMFS Extended Jurisdiction Planning Staff. Mr. Schoning has asked Dr. Rothschild to remian in this capacity for a period of approximately 4 months at which time he will return to his duties as Center Director in La Jolla. During Dr. Rothschild's absence, Mr. Izadore Barrett, who only recently returned from a year's educational leave at the University of Washington, will be the Acting Center Director.